



Eastlakes Town Centre

Operational Waste Management Plan

This report is based on information provided by Crown Group coupled with Foresight Environmental's knowledge of waste generated within the mixed-use development sector. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Crown Group.

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Revision	Issue date	Consultant/s	Reason/comments
1	29 May 2019	Kyle Renwick Scott Ebsary	Draft issue for review
2	8 October 2019	Kyle Renwick Patrick Arnold	Generation and system amendments due to updated plans provided by Crown Group – 25/09/19
3	9 October 2019	Kyle Renwick Patrick Arnold	Generation and system amendments due to updated plans provided by Crown Group – 08/10/19
4	14 October 2019	Kyle Renwick	Updated plans provided by Crown Group – 14/10/19

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1. Executive Summary

This waste management plan has been prepared by Foresight Environmental on behalf of Crown Group. The plan details the way in which the proposed development located on Evans Avenue, Eastlakes Sydney 2018 will manage the waste and recycling generated from the ongoing use of the development in accordance with the Botany Bay Development Control Plan 2013.

2. Overview of Development

The proposed development consists of five residential towers with mixed retail, a supermarket, shared office space, childcare and medical centre. The site is located on Evans Avenue and Barber Avenue with proposed vehicle entry to the site and loading dock from Barber Avenue.

This document provides a high-level overview of the waste estimates and spatial requirements for the residential and retail components as well as the proposed onsite waste management and collection strategy for the development.

The following waste generation estimates and associated equipment recommendations are based on the following NLA/apartment breakdown and usage assumptions.

Table 1: Retail Area Breakdown

Usage/Assumptions	NLA (m ²)
Retail	5,389
Supermarket*	3,844
Commercial	1,883
Childcare	733
Medical	500
Leisure	342
Community	287
Gallery	145
Total	13,121

*Supermarket will manage own waste – see Section 4.4

Residential waste estimates are to be broken down per unit per core of each tower as follows:

Table 2: Residential Unit Breakdown

Tower Core	Units
Core D	105
Core E	48
Core F	48
Core G	34
Core J1	51
Core J2	75
Total	361

3. Waste Generation Estimate

Based on the information provided, benchmark data from similar developments and Botany Bay DCP Waste Minimisation and Management guidelines, the primary waste streams expected to be generated in the ongoing operation of the development would be:

- Mixed recycling (plastics, glass, aluminium, steel)
- Cardboard and Paper Recycling
- Organic Recycling
- General waste

3.1 Residential waste generation

As the residential components of each tower are to be serviced by chute systems allowing only for the separation of general waste and mixed recycling, the residential waste estimates will be broken into just these two streams.

Table 3 - 8 summarise the expected quantities of waste and recyclables generated by all cores serving the residential apartments respectively. Estimations have been based on the Botany Bay's DCP 2013.

Table 3: Core D Residential Apartments Waste Estimate (105 apartments)

Tower A	kg/day	L/day	kg/wk	L/wk
General Waste	84	1,197	588	8,400
Mixed recycling	36	598	252	4,200
Total	120	1,795	840	12,600

Table 4: Core E Residential Waste Estimate (48 apartments)

Tower B	kg/day	L/day	kg/wk	L/wk
General Waste	38	547	269	3,840
Mixed recycling	16	274	115	1,920
Total	55	821	384	5,760

Table 5: Core F Residential Waste Estimate (48 apartments)

Tower C	kg/day	L/day	kg/wk	L/wk
General Waste	38	547	269	3,840
Mixed recycling	16	274	115	1,920
Total	55	821	384	5,760

Table 6: Core G Residential Waste Estimate (34 apartments)

Tower C	kg/day	L/day	kg/wk	L/wk
General Waste	27	388	190	2,720
Mixed recycling	12	194	82	1,360
Total	39	581	272	4,080

Table 7: Core J1 Residential Waste Estimate (51 apartments)

Tower C	kg/day	L/day	kg/wk	L/wk
General Waste	41	581	286	4,080
Mixed recycling	17	291	122	2,040
Total	58	872	408	6,120

Table 8: Core J2 Residential Waste Estimate (75 apartments)

Tower C	kg/day	L/day	kg/wk	L/wk
General Waste	60	855	420	6,000
Mixed recycling	26	427	180	3,000
Total	85	1,282	600	9,000

3.2 Retail waste generation

As all retail, shared office space, childcare and medical centre waste will be consolidated into one waste area, we will combine them into a single total.

Table 9: Total Retail waste estimate

Stream	kg/day	L/day	kg/week	L/week
Cardboard	342	8,379	2,394	58,653
Food Waste	966	3,450	6,761	24,147
General Waste	643	8,377	4,498	58,639
Mixed Recycling	101	1,688	709	11,817
Grand Total	2,052	21,894	14,362	153,257

4. Waste Management Systems

The following tables detail the recommended systems and suggested collection frequencies to manage the estimated waste profile for each component.

4.1 Residential Waste

Each residential component of the five towers will be serviced by a dual chute system in each core, i.e. one chute for general waste and one for mixed recycling (further details about chute operation is provided in section 8). 240L bins will be positioned at the base of each chute for both waste streams within the basement 1 level waste rooms. The bins will be monitored periodically throughout each day by building management and/or cleaning staff to ensure full bins are swapped for empty spares when required to prevent overflowing.

A standard council collection frequency of once per week for general waste and recycling has been used to determine the number of bins required in each core to deliver sufficient capacity. Bin estimates have been calculated to ensure that there is at least one spare bin available to be left under the chutes for each stream on collection days.

4.2 Residential Waste Management Systems

The following tables describe the bin systems required to adequately service each core. The total storage space allocated for residential waste is **374m²**.

Table 10: Core D waste systems - 105 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	36	1.00	8,640	8,400	0.43	15.35
Recycling	MGB - 240L	19	1.00	4,560	4,200	0.43	8.10
Total		55		13,200	12,600		23.45
Recommended Room Size (including circulation space)							35.17
Available Space							23.00*

*NB there will be an onsite manager moving bins from each core waste room when they become full to the main residential waste room. This will ensure there is enough circulation space within the core room at all times.

Table 11: Core E waste systems - 48 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	17	1.00	4,080	3,840	0.43	7.25
Recycling	MGB - 240L	9	1.00	2,160	1,920	0.43	3.84
Total		26		6,240	5,760		11.08
Recommended Room Size (including circulation space)							16.63
Available Space							42.00

Table 12: Core F waste systems - 48 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	17	1.00	4,080	3,840	0.43	7.25
Recycling	MGB - 240L	9	1.00	2,160	1,920	0.43	3.84
Total		26		6,240	5,760		11.08
Recommended Room Size (including circulation space)							16.63
Available Space							57.00

Table 13: Core G waste systems - 34 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	13	1.00	3,120	2,720	0.43	5.54
Recycling	MGB - 240L	7	1.00	1,680	1,360	0.43	2.98
Total		20		4,800	4,080		8.53
Recommended Room Size (including circulation space)							12.79
Available Space							28.00

Table 14: Core J1 waste systems - 51 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	18	1.00	4,320	4,080	0.43	7.67
Recycling	MGB - 240L	10	1.00	2,400	2,040	0.43	4.26
Total		28		6,720	6,120		11.94
Recommended Room Size (including circulation space)							17.90
Available Space							53.00

Table 15: Core J2 waste systems - 75 apartments

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
General Waste	MGB - 240L	26	1.00	6,240	6,000	0.43	11.08
Recycling	MGB - 240L	14	1.00	3,360	3,000	0.43	5.97
Total		40		9,600	9,000		17.05
Recommended Room Size (including circulation space)							25.58
Available Space							81.00

4.3 Retail Waste

Retail waste is to be consolidated and managed within the basement 1 retail waste room and retail compactors located on ground floor in the loading dock. Retailers will be responsible for the internal management of waste and recycling within their tenancy and the transfer of their waste to the retail waste systems on ground/basement 1 for disposal.

Table 16 details the recommended bin numbers and type and collection frequency for the expected quantity of waste from the retail component. It should be noted that these systems and waste estimates exclude the supermarket component – the supermarket operator (TBD) will manage waste internally and will be responsible for their own waste systems (section 4.4 provides further details regarding supermarket waste).

Table 16: Retail total waste systems

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m ²)	Total Footprint (m ²)
Cardboard/Paper*	Compactor - 23m3 Cardboard	1	1	4.00 (t)	2.39 (t)		
Food Organics	Pulpmaster - 4000L Tank	1	3	32,000	24,147	3.91	3.91
	Goliath Unit	1				8.69	8.69
Mixed Recycling	MGB - 1100L	5	3	13,200	11,817	1.48	7.40
General Waste*	Compactor - 23m3 Landfill	1	1	6.00 (t)	4.50 (t)		
Cooking Oil**	Heated Tank	1	1	800	800	1.00	1.00
Total bin footprint							19.51
Recommended Room Size – including circulation space							29.27
Recommended Room Size – including circulation space + 2.5m2 bin wash area							35.52

*Both the general waste and cardboard/paper compactors are to be located outside of the retail waste room and within the loading dock. They're dimensions have therefore been omitted from the total recommended room size.

4.4 Supermarket Waste

The supermarket and supermarket-managed bottle shop will be responsible for managing their waste internally within their back-of-house areas. Typically, the major supermarket operators have existing agreements with waste service providers and a standard format for the set-up of their waste systems. As such, specific details have not been provided in this WMP regarding their waste as the operator has not yet been determined. Provisions have been made for supermarket bins within the loading dock.

4.5 Other waste/recycling

The following waste streams are unlikely to be generated regularly but can be collected on call as needed:

- E-waste - collected by facilities management staff and consolidated for collection by specialty e-waste contractor for recycler (usually provided by the appointed waste contractor on an on-call basis).
- Bulky waste – a 9.5m² bulky goods storage area has been provided within the main residential waste storage area adjacent to the loading dock. Building management will inform all residential tenants of the procedure to access and utilise the bulky goods store. Building management will coordinate collection of bulky waste with the council waste contractor as required upon request.

Contractor/delivery waste – Waste generated onsite by contractors/deliveries must be taken back unless prior consent has been negotiated with facilities management.

5. Waste and Recycling Storage Areas

5.1 Residential Waste Storage Areas

The residential waste and recycling storage areas are located at the base of each core on basement level 1. Figure 1 below shows the location of each core and the path of transfer to the main residential waste storage area adjacent to the loading dock.

Figure 1: Residential waste storage area and path of transfer to main waste storage/collection area

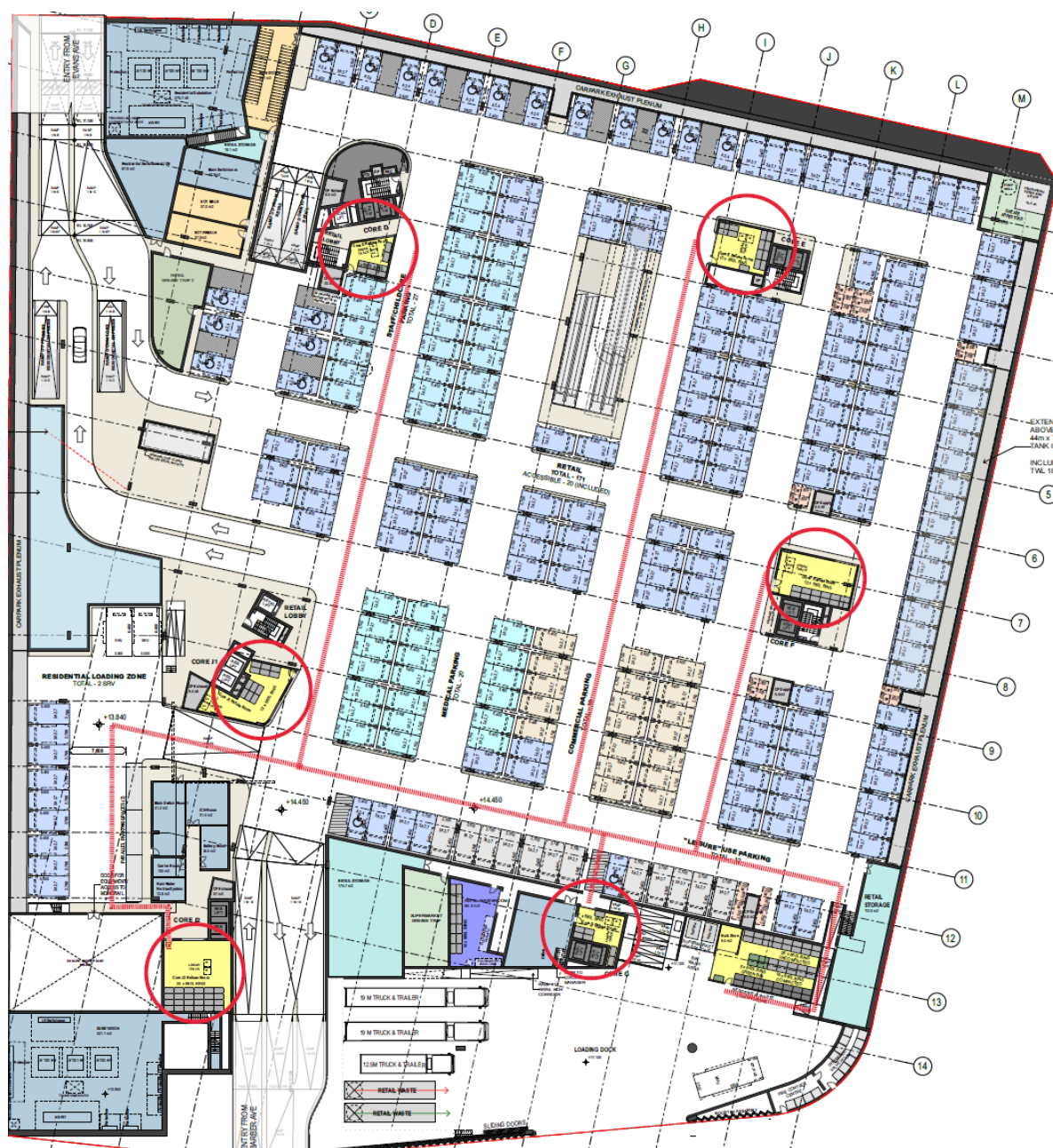
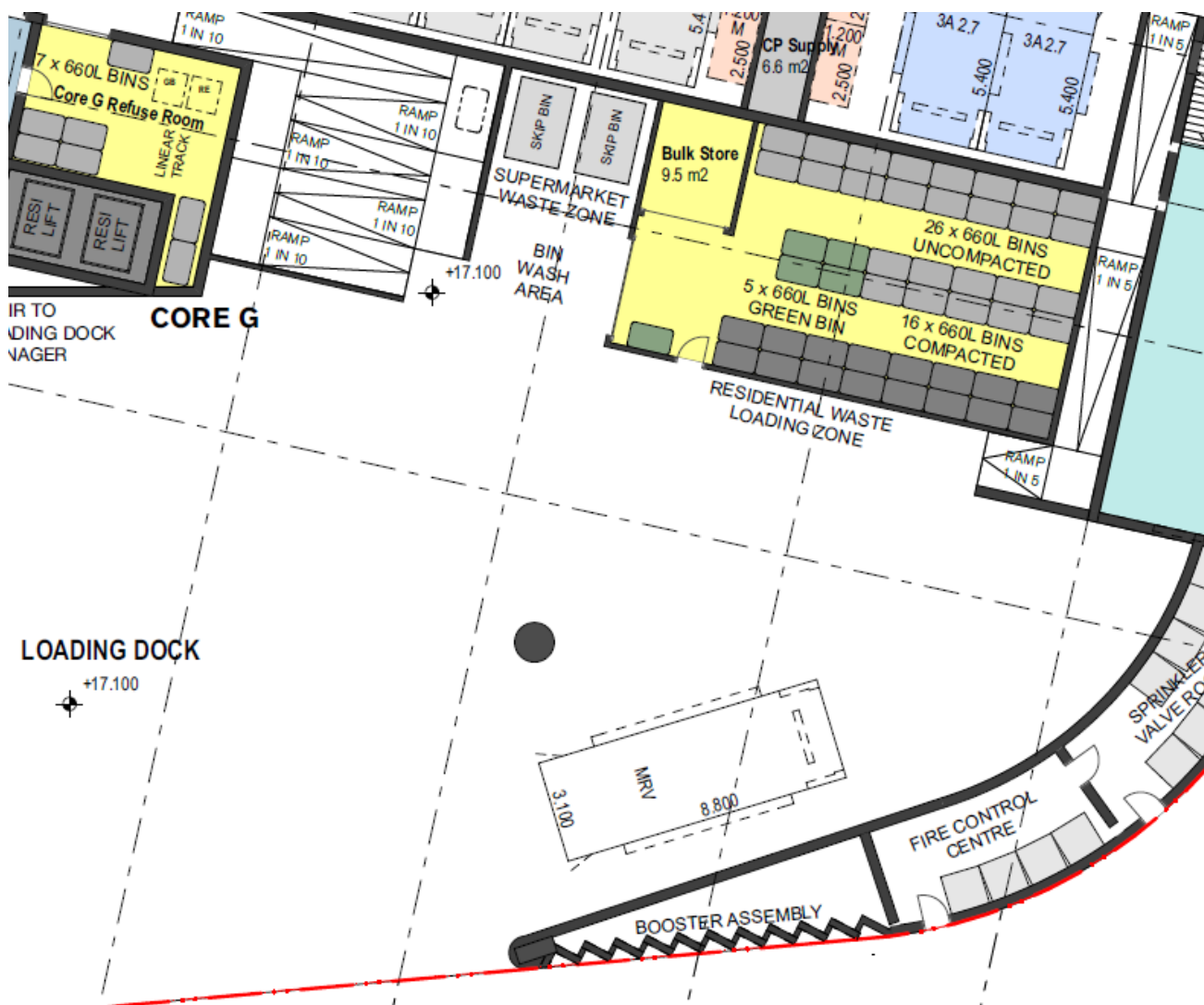


Figure 2 shows the main residential waste storage and collection area. The bins shown on plan represent the total number of bins from all cores likely to be presented on collection days (i.e. once per week). Green waste bins have also be shown – these will be managed by onsite garden maintenance contractors.

Figure 2: Main residential waste storage/collection area



5.2 Retail Waste Storage Areas

The retail waste facilities are split into two main areas:

1. Ground floor – general waste and cardboard compactors
2. Basement 1 – mixed recycling, organics, cooking oil and space for additional streams

Figure 3 shows the location of the compactors on ground floor and the path of access from retail areas.

Figure 3: Basement 1 Retail waste storage and path of transfer to loading dock

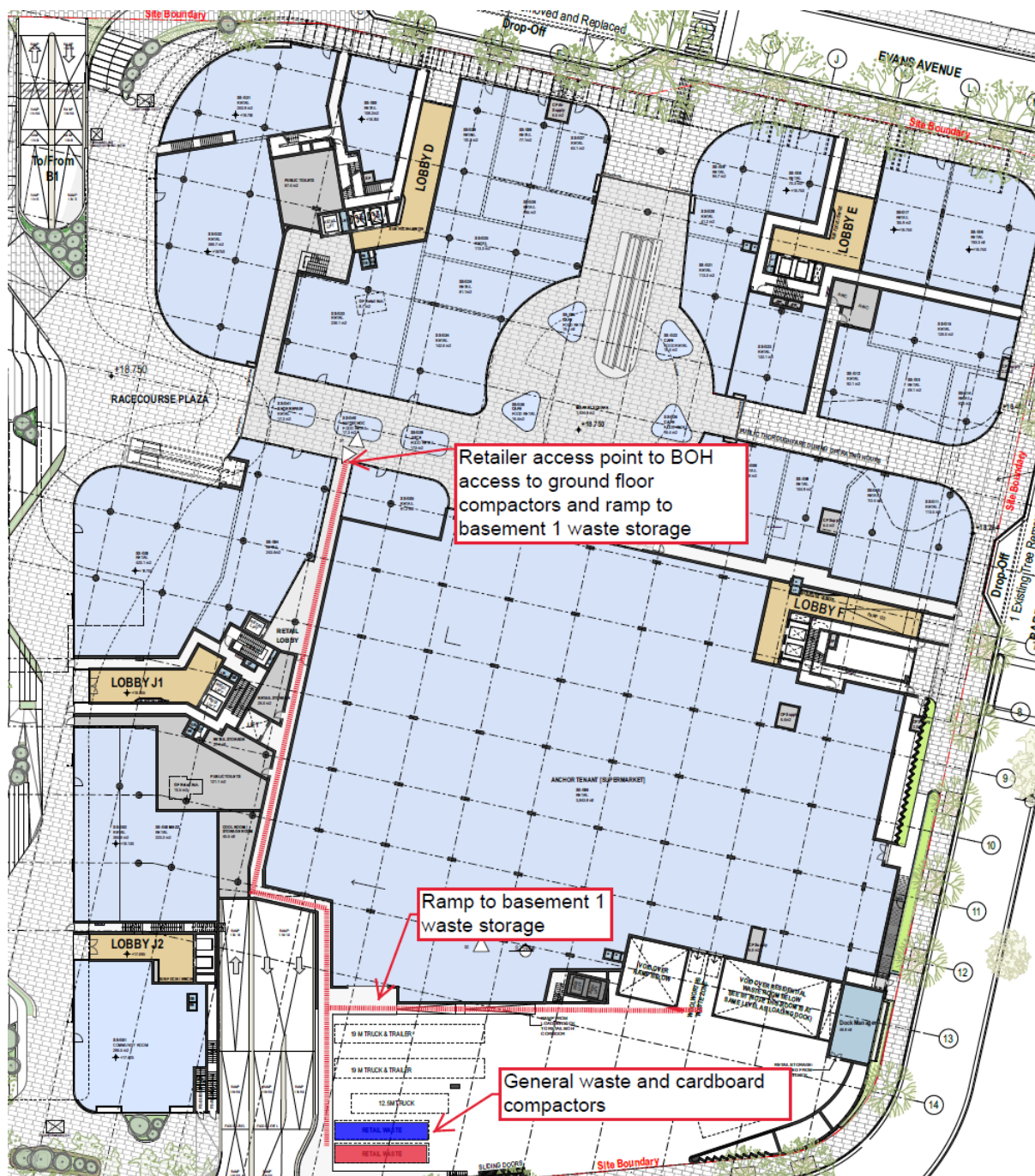
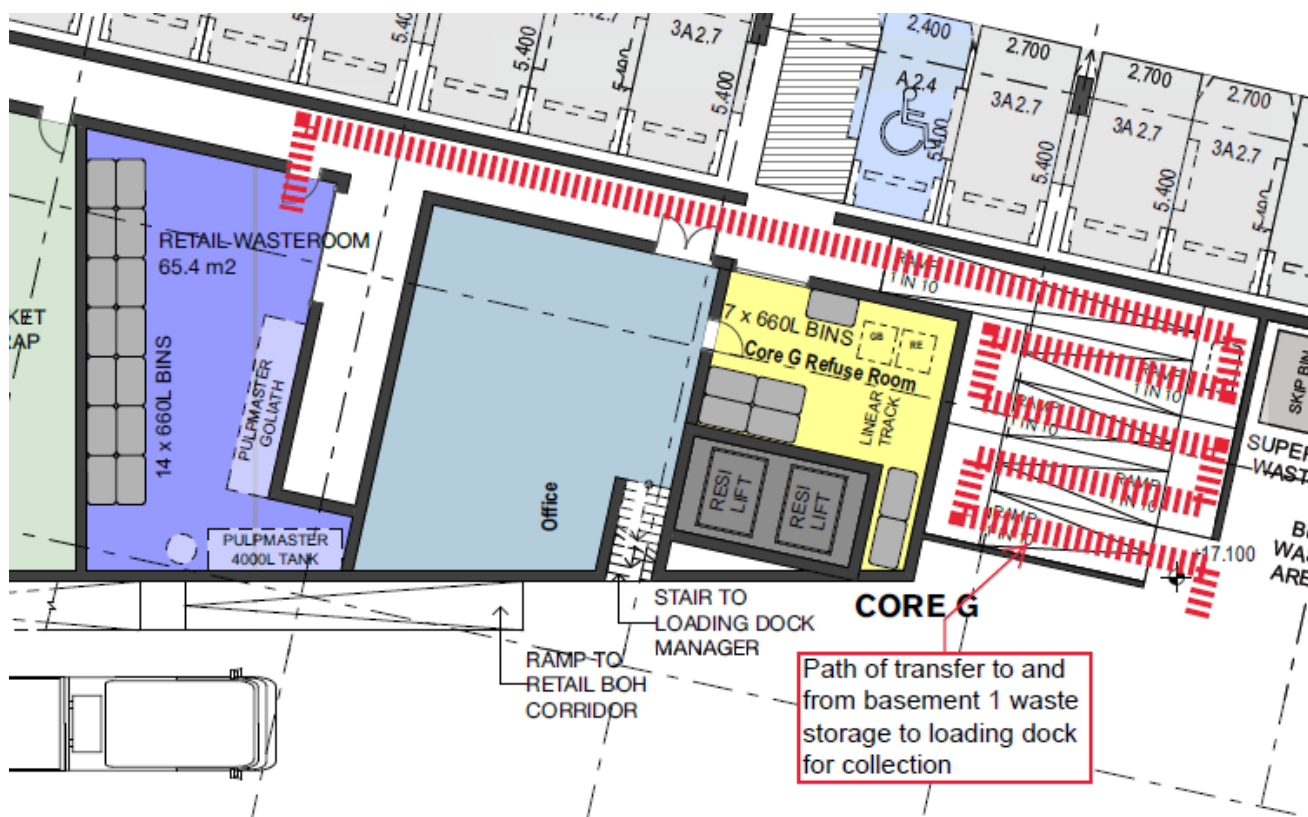


Figure 4 shows the basement 1 waste storage area and the path of access to transfer bins to loading dock for collection.

Figure 4: Basement 1 Retail waste storage and path of transfer to loading dock



5.3 Amenity

Each waste and recycling storage room will have the following features:

- Ventilation: The bin storage room will be ventilated to external air or mechanically exhausted in accordance with AS 1668.2-2002
- Vermin Prevention:
 - The bin storage room will feature tightly fitted doors
 - Opening will be vermin proof
 - Cleaners are to ensure that bin lids are closed when unattended
- Noise: Noise will not be an issue due to the location of the waste storage room away from public on basement level 1
- Floor: Structural concrete slab with smooth epoxy topping finish with coved wall and floor junctions. Graded drains to approved sewer connections – fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation
- Walls: Brick work/concrete block or similar finished in a light coloured, washable paint
- Ceiling: Structural concrete slab over
- Lighting: Base building lighting with switches inside and outside waste room (sensors may also be used)
- Water Supply: cold tap and hose connection
- Signage: clear signage identifying the various streams and appropriate use will be prominently displayed (see section on signage below)

The ongoing maintenance and up-keep of the waste storage room will be the responsibility of cleaning/building management staff. They will be tasked with ensuring bins are stored neatly and are cleaned as required.

5.4 Signage

All waste and recycling streams should be differentiated with clear signage on all bins and on walls within the waste storage room. Below are examples of appropriate signage incorporating textual information, pictures and colour-coding to communicate the message.

Figure 5: Individual stream signage



5.5 Colour-coding

To further reinforce the differentiation between waste and recycling streams, the main waste storage room will be colour-coded to ensure bins are stored in the correct area and to enable easy identification of the streams provided. This will be done by the operator in collaboration with the cleaning/waste contractor once operational. This can be done by painting borders on the floor indicating where bins should be stored. The colour of the paint should be consistent with the waste stream e.g. yellow paint for comingled recycling, red paint for general waste. The waste room walls can also be painted.

Figure 6: Indicative colour-coding guide

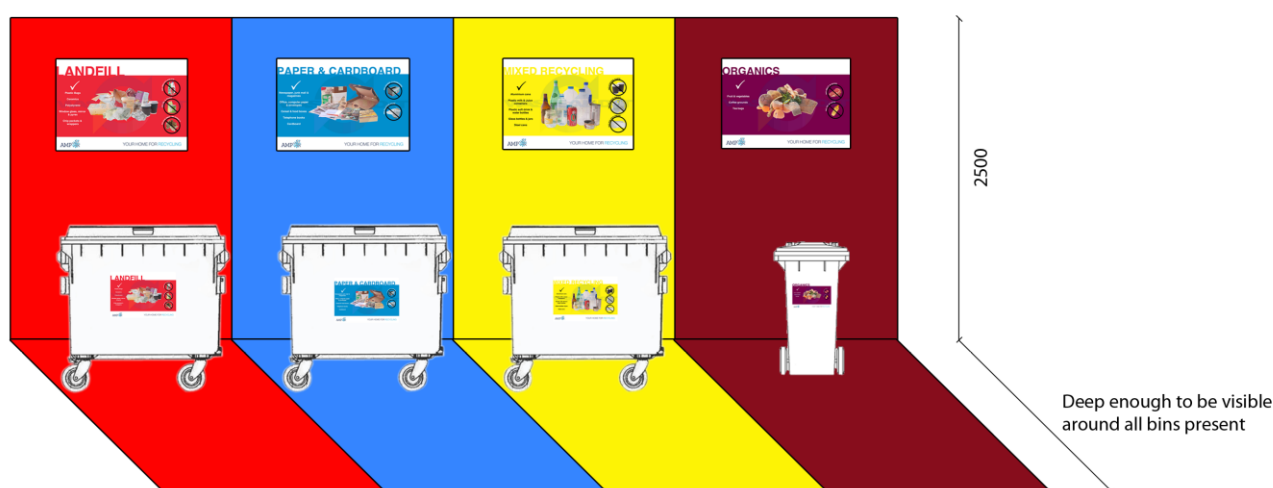
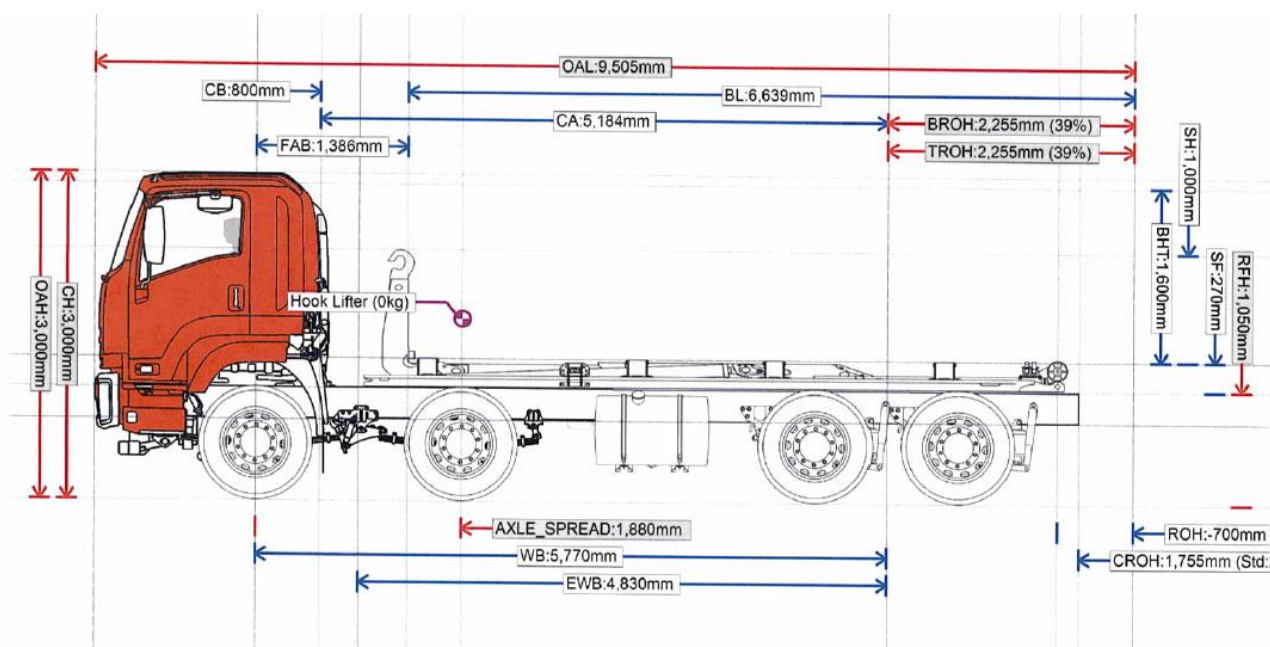


Figure 7: Example of appropriate colour-coding



Figure 8: Indicative copmactor truck dimensions



Technical side-view drawing of a truck chassis. The drawing includes the following dimensions and labels:

- Overall Length:** 7821
- Front Overlap:** 975
- Wheelbase:** 5500 WHEELBASE (STD WHEELBASES 4850/5350/5500)
- Front Overlap (AF):** 1350 AF
- Chassis Height:** 970 CHASSIS HT.
- Body Height:** 2672 BODY HT.
- Overall Height:** 3652 OVERALL
- Front Overlap (AF):** 1665
- Overall Length:** 10461 OVERALL
- Chassis Height:** 12
- Chassis Height:** 3296 = 59.9% OF WB

7. Collection

7.1 Residential Waste

Residential waste and recycling collections will be conducted once per week by the Council waste contractor. All collections will occur directly from the loading dock where the Council waste truck driver will have direct access to the bins stored within the residential waste storage area. Entry to the loading dock is off Barber Avenue. Table 17 details the proposed collection protocols for each stream from the residential component.

Table 17: Proposed residential collection protocols

Waste Stream	Residential Collection Procedure
Mixed Recycling	<ul style="list-style-type: none"> All full waste and recycling bins will be transferred from the chute rooms at the base of each core to the main residential waste storage area by building management as required prior to collection days.
General Waste	<ul style="list-style-type: none"> Council truck driver to retrieve all bins from the waste storage area (directly accessed from loading zone) and conduct collection. Empty bins will then be returned to the waste storage area. Building management will then return empty bins to the chute rooms at the base of each core for continued use.
Bulky Items	Building management will arrange collection of bulky items with Council or private waste contractor as required or periodically throughout the year – collections will take place directly from loading dock

7.2 Retail Waste

Table 18 details the proposed collection protocols for the waste and recycling from the retail component of the development.

Table 18: Proposed retail collection protocols

Waste Stream	Retail Collection Procedure
General waste and cardboard	<ul style="list-style-type: none"> • Retailers dispose the waste and cardboard material directly into compactors – accessed via BOH corridor on ground floor • Waste contractor to collect compactors on agreed collection schedule – assume once per week
Mixed recycling	<ul style="list-style-type: none"> • Retailers dispose their materials into the systems provided within the waste storage area on basement level 1 – accessed via the ramp from ground floor • Commercial waste contractor will be engaged to retrieve full bins from waste storage area and transfer to rear-lift truck in loading dock for collection. • Waste contractor to return empty bins to waste storage area for continued retailer use
Organics	<ul style="list-style-type: none"> • Retailers to manage food waste in small (23L) bins which they will transfer to the waste storage area on basement level 1. Full bins will be left and swapped for an empty bin. • Building management/cleaners will be responsible for emptying full organics bins into Pulpmaster. • Pulpmaster contractor to pump out storage tank on agreed collection schedule – based on estimates likely 4x per week
Cooking oil	<ul style="list-style-type: none"> • Retailers to transfer used cooking oil in drums or oil caddies to the vacuum oil silo located in the waste storage area on basement level 1 • Cooking oil contractor to pump out storage tank on agreed collection schedule - based on estimates likely 4x per week

8. Internal Management Protocols

8.1 Residential

Space will be allocated in each residential dwelling for the temporary storage of waste and recycling material generated. This space will allow residents to segregate their waste effectively within their living area. Waste and recycling will then be transported to the chute room which will be located on each floor of each residential building.

A dual chute system for each storage area will be used for the disposal of general waste and mixed recyclable material. This will allow residents to dispose of their segregated waste effectively. Each chute access point will display signage and colour coding to ensure residents understand the disposal process. Any bulky cardboard not suitable to be disposed down the chute will be left in the chute room and building management/onsite cleaners will periodically transfer cardboard to the respective waste room on the basement level.

At the base of each chute will be 240L bins which will be monitored by building management/onsite cleaners to ensure full bins are swapped with spare empty bins as required throughout each day – it is estimated that each room will require a bin swap every second day.

8.2 Retail

It is the responsibility of retailers to separate general waste and recyclables from within their tenancies and transfer them to the dedicated retail waste room located in the basement periodically throughout each day or as required.

The waste and recycling facilities located in the retail waste storage areas are easily accessible by retailers. Ease of access to the waste storage area will enable tenants to safely transport and dispose of the material directly into the relevant system in the waste areas. All systems will be well signed and maintained.

The waste storage areas and access to the facilities is level with no raised platforms or steps. This allows retailers and contractors to easily manoeuvre waste bins throughout these areas.

Tenants will be encouraged to separate their waste and recycling materials with appropriate BOH systems to effectively manage their waste and maximize the diversion of recyclables from the general waste stream.

The following figures show examples of appropriate BOH systems for effective separation.

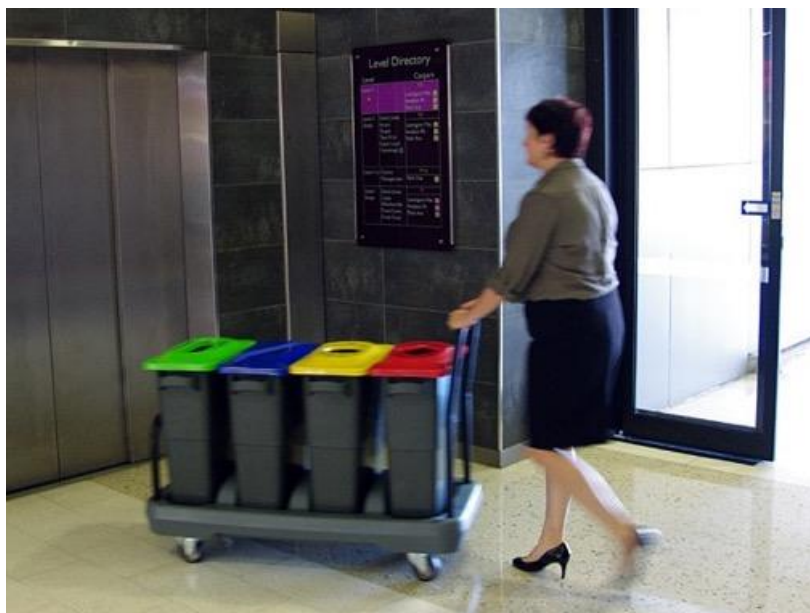
Figure 10: Examples of small waste/recycling "multisort" bins for bin hubs (60L or 90L)



Figure 11: Examples of “multisort” bins integrated into cabinetry



Figure 12: Examples of multi-sort transport trolley



9. Conclusion

The details of this waste management plan confirm that the waste facilities provided in the proposed design adequately cater for the projected waste generation rates at the completion of the development.


10. Appendix

10.1 Chute Information


Each core will have two individual chutes as described in figure 13 for both general waste and mixed recycling.

Figure 13: Example of a standard chute functionality


LINEAR NO COMPACTOR
Built to minimise strata cost
Can be fitted with 240, 660 or 1100 litre bins
Fully automatic
Designed for building where no compaction required
Minimises bin movement
Low maintenance
415 Volts - 10Amp




240 LITRE



660 LITRE



1100 LITRE

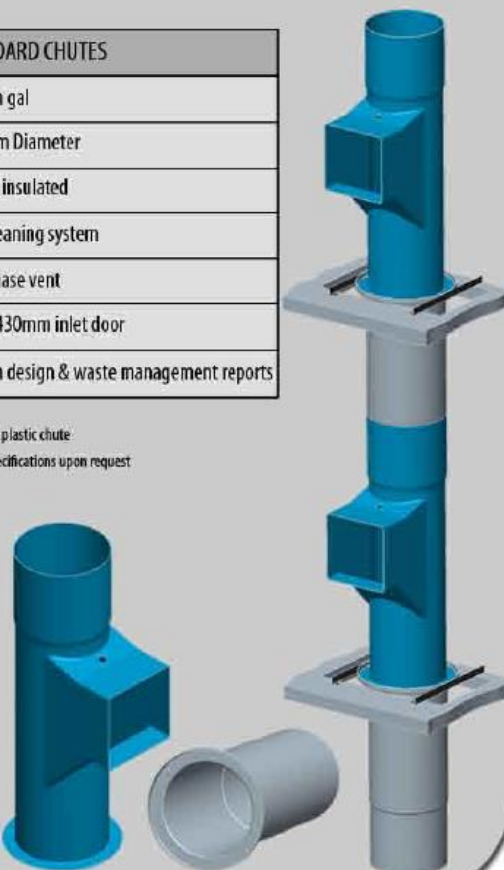


LINEAR

BIN COMPACTOR + CAROUSEL OR LINEAR
Built for under chutes systems in high rise building
Waste falls directly into bins
Fits over carousel or linear system
Compacts into, 240, 660, 1100 standard bins
Fully automatic, compaction ratio 2:1
Minimise strata cost
Low cost maintenance
415 Volts - 10Amp

STANDARD CHUTES
1.6mm gal
510mm Diameter
Sound insulated
Self cleaning system
150 Phase vent
430 x 430mm inlet door
Help in design & waste management reports

Optional plastic chute:
More specifications upon request



10.2 MGB Dimensions

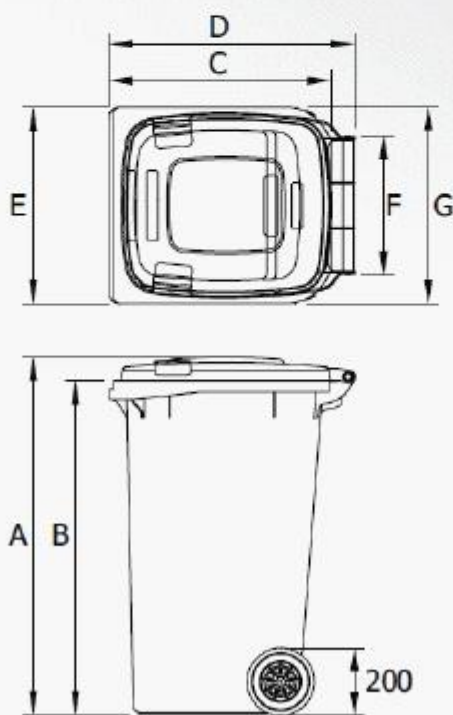
240L MGB

Dimensions - Weights - Standards

■ Nominal volume:	240 litres
■ Net weight:	approx 13 kg
■ Max load:	96 kg
■ Permitted total weight:	110 kg

■ A	1060 mm	■ D	730 mm	■ G	550 mm
■ B	990mm	■ E	585 mm		
■ C	660 mm	■ F	400 mm		

Measurements to be used as a guide only – variations will occur

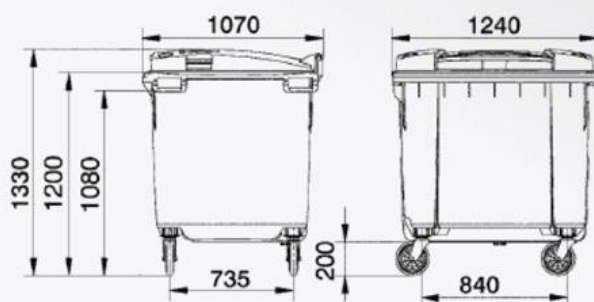


1100L MGB

Dimensions - Weights - Standards

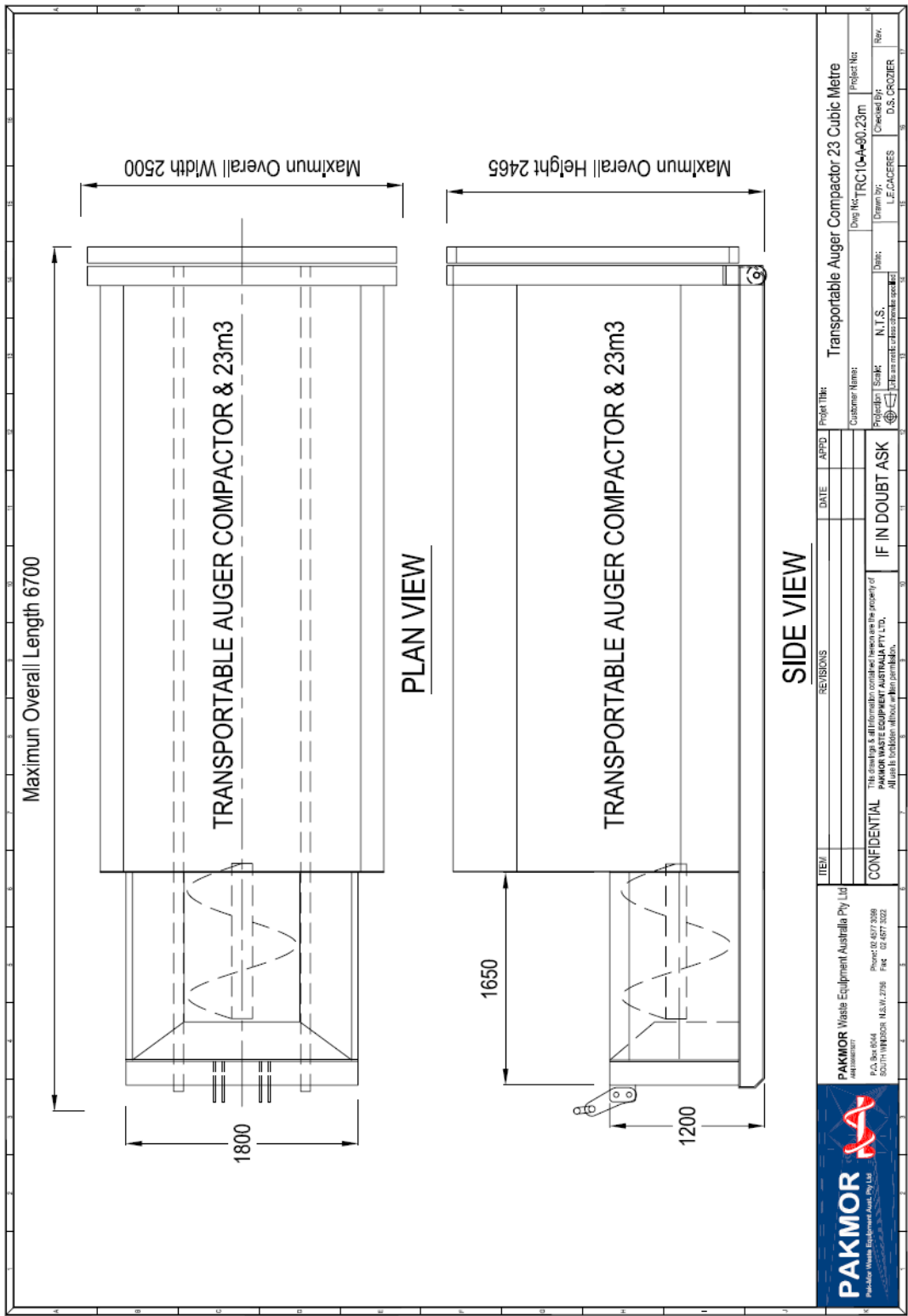
■ Nominal volume:	1100 litres
■ Net weight:	approx. 65 kg
■ Max. load:	440 kg
■ Permitted total weight:	510 kg

Measurements to be used as a guide only - variations will occur



10.3 Indicative compactor dimensions

Final spec to be confirmed with appointed waste contractor



10.4 Pulpmaster

Pulpmaster Goliath: LHF Configuration

Pulpmaster Position - Right; Bin Lifter Position - Left

